

DOCUMENT RESUME

ED 164 584

TM 008 057

AUTHOR Minter, Mary; And Others
TITLE Implementing a Minimum Competency Testing Program.
Report No. 77.39.
PUB DATE Mar 78
NOTE 21p.; Paper presented at the Annual Meeting of the
American Educational Research Association (62nd,
Toronto, Ontario, Canada, March 27-31, 1978)

EDRS PRICE MF-\$0.83 HC-\$1.67 Plus Postage.
DESCRIPTORS Academic Achievement; Grade Equivalent Scores;
*Graduation Requirements; *Mastery Tests; *Minimum
Competency Testing; *Program Development; Reading
Achievement; Remedial Instruction; Secondary School
Mathematics; Senior High Schools; *Testing Problems;
*Testing Programs; Test Validity

IDENTIFIERS Austin Independent School District TX; California
Achievement Tests; Sequential Tests of Educational
Progress

ABSTRACT

Administrative and technical problems were encountered in carrying out a minimum competency program for high school students in the Austin (Texas) Independent School District. The history of required minimum competency testing was reviewed briefly, and the process of clarifying and operationalizing the requirements was described within the Austin system, decisions were made about which students were to be tested, when, where, and by whom. A consideration of test security problems led to the decision to form an item pool using Rasch procedures to scale and select items and to identify cutting scores. The question of possible test bias was resolved by accepting the Rasch model of test fairness. The problem of curricular validity was resolved by subjective review of test content by the district curriculum staff. A suggestion was made that a study should compare the operational definition of eight grade competency with the intended meaning as perceived by the board of trustees who formulated the policy. The number of students who passed the tests after several successive test administrations is indicated. Testing began at the end of the ninth grade, so that students needing remedial instruction could be identified while still in high school. (CTM)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED164584

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

TM 008 057

IMPLEMENTING A MINIMUM COMPETENCY
TESTING PROGRAM

Mary Minter
James Watkins
Paula Matuszek

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

Paula Matuszek

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC) AND
USERS OF THE ERIC SYSTEM."

Paper presented at the annual meeting of the
American Educational Research Association,
Toronto, March, 1978

PRINTED IN U.S.A.

Publication Number 77.39

TM 008 057

Introduction

The cry has been growing for some time--students graduate from high school and arrive at college or a job without even minimum adequacy in very basic subjects. They can't read instructions. They can't balance their check-books. They can't write a coherent sentence. As early as 1958, a survey carried out by the city of Denver showed that most businessmen considered a high school diploma to indicate attendance in school for 12 years, but not much more.¹ Similar opinions have been expressed in a variety of other forums. In addition, a survey carried out by the University of Texas showed that between a fifth and a third of adults have difficulty functioning in such basic areas as math computation, health, and consumer economics.² The public, faced with these findings, declining SAT scores, declining achievement scores and other indicators of problems, is increasingly demanding to know why today's high school education does not in fact seem to educate.

Some of the answers are clear. Today's schools have too many tasks. They carry the major burden of integrating society. They teach students to like and value themselves and others. They try to provide each student with an education which allows him to explore who he is and where he is going. Perhaps, with so many goals competing for instructional time, it's not too surprising that not everyone learns to read.

In response to such competing priorities there has grown up the "back to basics" movement, an insistence that schools should concentrate first on teaching very basic skills such as reading and math. And following in the wake of this movement comes another--the trend toward minimum high school graduation competency requirements, with assessment by tests to demonstrate that students have indeed learned these basics.

Standardized testing at the high school level is not new, of course. Achievement tests, aptitude tests and college entry tests have been given in high school for many years. However, along with the movement toward more "humanized" education of the 1960s and early 1970s came a lessened emphasis on testing. In addition, controversy over the appropriateness for minority students of aptitude and IQ tests used for tracking and placement decisions grew, and the general issue of test bias began to receive a great deal of attention. Although this controversy was focused primarily on aptitude tests, negative feelings of any kind inevitably spilled over onto standardized tests of all kinds. Thus testing of any kind was, for a time, given relatively low priority.

Many concerns over testing and the use of tests remain. Educators express fears that tests used for graduation requirements will dictate a very narrow curriculum aimed specifically at the test.^{3,4} They feel that a minimum competency requirement will also tend to become a maximum goal, beyond which students won't try to learn and teachers won't try to teach.⁵ They are concerned about the "labeling" effect of yet another test, and about the consequences of telling substantial numbers of teenagers that they are not competent.⁶ They are concerned that the testing will force substantial changes in

the entire school system, ranging from the kinds of courses taught to the way progress is reported to the parents, and especially concerned that these changes are not foreseen and planned for.⁷ They worry that resources for adequate test development and administration will not be made available, leading to the use of restrictive tests developed in isolation from a district's curriculum.⁸ As the competency testing movement itself grows, such concerns are being expressed more frequently in a variety of national forums.

Review of Current Activities in Competency Testing

Nonetheless, in spite of these concerns, competency testing is clearly on its way. In 1969 Denver initiated its Proficiency and Review Test Program, which still continues. Three years later, in 1972, Oregon became the first state to mandate a minimum competency test for high school graduation.

In 1975, Florida and California passed minimum competency test bills and a number of individual school districts (including Gary, Indiana, Anchorage, Alaska and Austin, Texas) were involved in setting up tests for graduation. By May of 1976, there were seven states with legislation or education board rulings mandating competency testing of some kind, and six more with legislation pending. Individual school districts also continued to set up such programs. By January, 1977, 17 states had established some kind of minimum competency program.^{9,10}

At that point the movement really escalated. In a September, 1977, publication, ETS listed 20 states as experimenting with or piloting some kind of competency test program, 16 more states as planning one, and 11 more as studying the matter. Only three states had no plans for minimum competency testing activities.^{11,12}

Many of these minimum competency tests at the state level are designed primarily for assessing student progress throughout school, rather than for graduation requirements. But by December, 1977, there were 18 states which required minimum competency tests for graduation from high school. There were twelve more which requires tests, but did not tie them to graduation. Of the 18 which require passing a test to graduate, two are requiring it already, seven more have set a date some time later than June, 1978, by which time it will be required, and nine are working on a test or otherwise studying the procedure.¹³ In addition to the activity at the state level, many local school districts are now involved in competency testing. For instance, of the seven largest urban school districts in Texas, only one is neither testing, considering testing, nor studying the idea of testing its seniors before graduation. In addition, discussion is underway regarding a federal bill requiring minimum competency testing nationwide.

Typically, such requirements are in basic academic subjects such as reading, writing and math, or in applications of these subjects to life skills such as filling out forms, calculating income taxes, etc. Some requirements extend beyond such basic applications into competency in a variety of adult activities. For instance, items included might measure not only ability to balance a budget, but also general knowledge about how to set one up, wise use of credit, and other aspects of financial credit. Most such tests are pencil and paper, and most systems provide for initial administration long before twelfth grade, to allow time for remediation.

Beyond this general summary of minimum competency testing, however, there are a variety of detailed questions which must be faced by any school district about to implement a program such as this. While passing the initial legislation or policy is relatively easy, going from mandate to actual test scores is another matter entirely. How one district dealt with the questions and problems encountered is discussed below.

Establishment of Policy and Procedures

When a school district sets minimum competency requirements for graduation, those charged with the implementation and management of the competency testing program are likely to spend many an hour working on expected and unexpected problems that arise. We will share with you some of the problems experienced by the Austin Independent School District in planning and implementing its competency testing program.

The first problem that had to be considered was the policy statement itself. In 1975, the first version of the minimum competency testing requirement was passed by the Austin Independent School District (AISD) Board of Trustees. It stated:

"Students not demonstrating at least an 8th grade reading level, as measured by the California Achievement Test, will be placed in classes to remedy indicated deficiencies, including courses beyond the 9 quarters of required Language Arts unless the student places on file a letter signed by a parent or guardian acknowledging that the student proposes to graduate without achieving an 8th grade reading level."

"All students will begin their required Mathematics in the fall quarter 9th grade and continue with Mathematics courses each quarter until their Mathematics requirement is met. Students not successfully completing 3 quarters of Algebra or its equivalent will be given a Mathematics test covering the 48 basic competencies as defined by the National Council of Teachers of Mathematics. For students who fail to achieve a 75% performance score, further courses will be required to remedy the deficiency unless the student places on file a letter signed by parent or guardian acknowledging that the student proposes to graduate without basic skills in Mathematics as specified by the NCTM." ¹⁴

The Office of Research and Evaluation pointed out some other test management problems that were inherent in the wording of the Austin policy statement.^{15,16} Several such problems surfaced. First of all, the statement mandated the use of one specific test, the California Achievement Test (CAT), which was being replaced for general testing in the Austin high schools because of its limitation in measuring achievement at the high school level. The Sequential Tests of Educational Progress (STEP Tests) had been selected as a replacement for the high school districtwide testing program.

Secondly, the statement was ambiguous about the requirement(s) for remedial classes. It appeared that students had the option of filing a waiver letter and avoiding the remedial classes completely.

Finally, the policy statement seemed to suggest remediation in ninth and tenth grade. This left unclear whether the remediation courses could replace the state-mandated courses in language arts and mathematics.

After hours and months of deliberation between board and staff members, the requirement was revised in December, 1976. The approved revision read as follows:

"Students will be required to demonstrate at least an eighth grade competence in reading or place on file a letter signed by parent or guardian acknowledging that the student proposes to graduate without achieving an eighth grade level in reading."

"Students will be required to demonstrate at least an eighth grade competency in mathematics or place of file a letter signed by parent or guardian acknowledging that the student proposes to graduate without achieving an eighth grade level in mathematics."¹⁷

The policy statement revision was accompanied by an administrative procedure statement which set forth the details for how the requirement could be met. The procedure statement read:

The Austin Independent School District graduation requirement of an eighth grade competence in reading and mathematics may be met by any of the following options:

- 1) Achieving a score on the eighth grade administration of the California Achievement Test which represents national median performance for eighth grade students.
- 2) Achieving the raw score equivalent to the national median performance by eighth grade students on any annual administration of the Sequential Test of Educational Progress.
- 3) Achieving a score on the California Achievement Test (level 4), at any readministration subsequent to high school entry, which represents national median performance for eighth grade students.

The first of several technical problems that required resolution was to devise an operational definition of the "8th grade competency" that was specified in the adopted board policy. Actually, three forms of the operational definition were required:

- . one definition for use with the level 4 form A of the California Achievement Tests.
- . a second definition (which should be equivalent to the above) for use with form B of this same test.
- . third definition for use with the Sequential Tests of Educational Progress (STEP).

Two different considerations had to be resolved before the operational definition for level A of the CAT (for testing 8th grade students) could be established.

- . The expression "8th grade" in the policy statement might imply either the use of a norm reference standard or a content-referenced standard. In the case of the Austin policy, the discussions by the board of trustees clearly indicated that the national norm referenced standard was intended by the board. This standard was therefore incorporated into the operational definition.

- Since form A of the CAT (the 8th grade test) is administered in February, it would seem reasonable to define the cutoff score for 8th graders as the 50th percentile point (national norm) for a mid-year testing date. There was some discussion however of insisting that the "8th grade competency" should refer to the competency that would exist at the end of the 8th grade year rather than at midyear. If this alternative were adopted, the cutoff score would have to be the end of year 50th percentile point rather than the midyear 50th percentile point. Practical considerations resolved this issue in favor of the use of the midyear 50th percentile point as the cutoff score. Most students who would score an end of year 50th percentile at the end of the 8th grade would be expected to score a midyear 50th percentile in the middle of the 8th grade year. There seemed to be little purpose in denying competency status to these students on the 8th grade administration of the CAT since most of these students would achieve competency anyway next year during the next year's testing session.

The final operational definition of "8th grade competency" for the CAT level 4 form A (the 8th grade test) was thus:

- A score of 50th percentile or higher, based on 8th grade national norms for midyear testing.

The operational definitions for form B of the CAT and for the STEP then had to be defined so as to be equivalent to the above operational definition. For form B of the CAT, the equivalent cutoff score was easily defined --exactly as for form A, except that the form B percentile tables are used rather than the form A tables.

The operational definition of "8th grade competency" for the STEP administrations at high school was not so straightforward. No equivalency studies were available to relate the CAT and the STEP; and the Austin Evaluation Office did not have the resources to conduct such a study. One possible source for equivalencies was the Anchor Study Conducted by the Educational Testing Service.¹⁸

Although the Anchor study results were restricted to reading tests and for grades 4-6 only, some extrapolation of these Anchor Study results to the Austin needs appeared to be the most reasonable alternative available. This extrapolation was based on the observation that for each of grades 4, 5, 6, a 50th percentile score on the CAT Reading Test Level 4 was approximately equivalent to a 45th percentile score on the STEP level 3 Reading Test. Assuming that this relationship is also approximately true at the 8th grade and is approximately true for math tests as well as for reading, the following rationale can be used to determine "8th grade competency" for STEP administrations that would be equivalent to that used for the CAT:

- the 8th grade 50th percentile point on the CAT is "equivalent" to the 45th percentile on the STEP, level 3 (based on the extrapolations of the Anchor Study, discussed above).
- Using the scale scores that link the different levels of the STEP, it is found that the 45th percentile of STEP level 3 corresponds, on level 2, to a raw score of

28 for the STEP level 2 Reading Test,
 26 for the STEP level 2 Computation Test, and
 20 for the STEP level 2 Math Concepts Test.

The operational definition of "8th grade competency" for the high school administrations of the STEP are thus the three raw scores listed above.

The logic that was involved in the development of these STEP competency scores was rather tenuous and disquieting. Therefore, the Austin Evaluation Office staff examined some hit-and-miss contingency tables which were created with existing data to ascertain the adequacy of the STEP operational definition. For both reading and math, the consistency of the "pass/no pass" decision between the 8th grade CAT administration and the 9th grade STEP administration is reasonably high. The two tables below display these results.

		9th Grade STEP Reading				9th Grade STEP Math	
8th Grade CAT Reading		pass	fail	8th Grade CAT Math		pass	fail
	pass	47%	5%		pass	40%	8%
	fail	11%	37%		fail	5%	47%

Implementation

Only after these decisions had been made could the Department of Secondary Education and the Office of Research and Evaluation attend to the specific details of implementation. It became clear that there were still issues which were basically policy in nature, which needed to be resolved:

- 1) When could/should students bring letters? Were students to complete the other graduation required coursework in math and language arts and then bring the letter? Could they avoid completing the state mandated course requirements?

It was decided that students will complete their state required coursework before being required to enroll in the necessary remedial course(s). These students who have not met the competency requirements by the time they have completed the required coursework, must enroll in the tutorial class for at least one quarter before they are eligible to request waiver from the requirements by means of a letter.

- 2) What about transfer students? Should all transfer students be subject to the competency requirements? What about those students who had already earned some of their senior credits at the time of the transfer?

The decision was made to exempt transfer students from the testing requirements if they 1) entered high school before 1974-75 or 2) had earned at least one senior level credit in the other district before they transferred to the Austin ISD.

- 3) What about special education students? Are they to be required to meet the competency requirements? Should special waivers or exemptions be granted to some of the special education students?

Special education students would be exempt from the competency testing program if they 1) were in a self-contained special education classroom, or 2) were enrolled in integrated special education classes.

Some of these decisions were reached immediately as they were prerequisites to implementation. Other decisions have been evolving, more or less. All of the issues mentioned, however, preceded the administrative procedural problems that still had to be addressed by the Office of Research and Evaluation, the office having primary responsibility for administering the competency tests.

Figure 1 presents a checklist summarizing a number of administrative questions which ORE needed to resolve. Included were problems regarding the actual testing, analyzing the results, and reporting the results.

Figure 1:

- 1) Which students must be tested? How would these students be identified and informed? When should the first test be administered?
 - 2) What additional personnel would be needed to help identify students needing to be tested? Would additional persons need to be hired to help administer and monitor the test session? Who would score the test? Where would funds for hiring and training them come from? How much training would be needed? Have such personnel already their TB tests?
 - 3) What form of the test would be used? What materials are already on hand? What additional materials must be purchased? What materials needed to be ordered?
 - 4) How would the data be recorded, stored and retrieved? How much programming time would be needed? What about the computer program to be used? Who pays for data programming costs?
 - 5) How would results be reported to school, students, and parents?
-

The Office of Research and Evaluation developed a timeline that considered each of these implied tasks. The requirement would be effective with the group of students who were the 10th graders in 1976-77. Those students nearing the end of their course requirements in mathematics in Spring, 1977. Many of them had taken the CAT in 8th grade and/or the STEP in 9th grade prior to the new policy requirements. They had no idea at the time that they took the tests that graduation depended on passing the test. Many had not passed the tests. It was decided that these students should be afforded another opportunity to meet the requirements before being placed in remedial classes. Consequently the first administration of the competency tests in the district was geared to this group of students.

Counselors were contacted to assist in identifying and informing students at 10th grade who had not yet passed the graduation requirements. Additional funds were located in the Dept. of Secondary Education budget for additional staff and reproduction costs. Test answer sheets were ordered. A quadruplicate reporting form for test scores was designed and ordered. Test sites were scheduled and set up. Additional personnel were hired to administer, monitor and score the test. New personnel were trained and the testing began. Quadruplicate forms were designed for recording the scores and dissemination these results immediately. It provided three copies of the hand-scored results to the school within a twenty-four hour period--thus allowing sufficient time to inform students of whether they needed to register for Fundamentals of Math Tutorial classes (FOMT) the remedial classes, prior to the registration period for fall classes. Finally, the testers were paid and results were disseminated to the schools.

The first round of competency testing had been completed. New problems began to emerge immediately. What about test security for future testing? Since the tests must be given each quarter, the office must ensure that test items not become available to students beforehand. A different form of the test clearly had to be ordered before the fall testing. However, a long-term resolution of this problem has not been found. This issue is discussed in more detail later.

Another emerging problem was whether the final exam for the FOMT classes should be administered by ORE or by the teacher? Since these students must meet the proficiency requirements it was logical that the final exam would be a form of the standardized test (CAT). Would it be the same form? If so, again there are the concerns over test security.

The initial resolution was to have the teachers administer the CAT, Form B, but with an ORE monitor present, but subsequently ORE has administered it for efficiency purposes.

A third problem arose from the anticipated need for retrieval of all of a student's results as more and more testing sessions take place. Thus, for instance, a counselor might eventually need to establish whether each of several hundred 12th graders has met this competency on any of the many CAT testing sessions and 4 STEP testing sessions to which he might have been exposed. For the number of students in this district, this is only feasible by computer. But can we have all of the programming bugs worked out in time to get the needed information to counselors, registrars, teachers, and principals before beginning to schedule the next round of tests? Have all special students been identified? What about bad (erroneous) students ID numbers?

These are the major problems which had to be resolved. Consideration of and attention to such issues before beginning competency testing program should help it move more smoothly, with a minimum of problems.

But then there are always the little problems that sometimes seem to mount in geometric progression:

- . The notices being mailed at the wrong time.
- . Not all of the information being complete on the forms so that the testing session is delayed and lunch is scheduled only 15 minutes after the testing session is scheduled to end.
- . An error in the computer program which causes some students not to get credit for passing the test...

Test Security

All in all, there are various categories of problems, some of these problems have rather straightforward solutions. Others are of a more technical nature and may require special consideration. One of these problems --test security--is discussed in this section.

Test security has been, and remains, one of the greatest problems of the competency program. With the adoption of the board policy, satisfactory performance during the testing sessions became more important to many students. It was feared that underground copies of the tests would soon be available on all school campuses.

Only limited physical security measures could be applied to some parts of the competency testing program. The 8th grade testing and the STEP testing in the high schools was part of the districtwide testing program. Not enough resources were available to improve the physical security of these massive testing programs. However, the special administrations of the CAT Form B to high school students were small enough in scope to permit improved physical security. For these CAT Form B administrations, test booklets were personally delivered to the testing sites by a representative of the evaluation office. This representative remained at the site during the entire testing session, collected and inventoried all test booklets immediately after the testing was completed, and returned the booklets to a storage area.

- . The procedure described above is a costly one, requiring several visits to each of nine high school campuses during each quarter of the school year. The adequacy and the cost effectiveness of the procedure can be questioned in several different respects.
- . The high degree of control of test booklets for CAT Form B might be considered as a locking of the front door of the house while leaving the back door unlocked and the windows open. That is, if the higher security imposed on the high school CAT administrations is not equally applied to the other testings, then what security is really present?
- . None of the test forms that are used in the competency testing program (CAT Forms A and B, and STEP) are forms that are controlled by the publisher. It is conceivable that anyone who wished to obtain a copy of any of these tests might do so simply by ordering them from the publisher on "official" stationery.
- . Many high school students take the CAT once each quarter until they have passed. Since each of these quarter testings involves the identical form, memory effects will inevitably have some impact on the results.

The only resolution of the problem seems to require administration of a different form of the test on each different testing occasion. Consideration is now being given to the creation of an item pool, containing items relating to the math and reading competencies. This pool would serve as a sampling frame from which items could be drawn and assembled to create a test form. A different sample could be drawn for each test administration.

In such an approach, several factors must be considered.

- . A method must be available for insuring that each independently created test form is parallel to previously created test forms.
- . The cut off score on each form must represent the same attainment: 8th grade competency.
- . Cost constraints will require that the number of pages on each test form be as few as possible, so there must be an upper limit to the number of test items that may be included on each test form.

The Rasch model ^{19,20} appears to be promising as a solution to these problems. The following tentative plan is being explored, using reading competency as an example:

1. First, the 8th grade reading competency cut off score (i.e., the raw score of 55 on CAT form A, corresponding to an 8th grade midyear 50th percentile) is expressed in terms of the Rasch model, as follows:
 - . All items on the CAT Reading Test are Rasch-calibrated on a common logit scale.
 - . Each item is checked for goodness of fit to the Rasch model.
 - . Assuming that all items have satisfactory goodness of fit, the estimate of person ability (on the logit scale) that corresponds to a raw score of 55 is defined as the cut off point on this logit scale.

Some discussion has ensued as to the proper course of action if one or more of the CAT items do not satisfy the Rasch goodness of fit test. George Ingebo of the Portland Schools suggests that if only a few of the CAT test items fail to meet the goodness of fit criteria, this will have only negligible impact on the final results.²¹

2. The CAT items thus form the kernel of an item pool. However, the only items that would actually be placed into the pool would be those items whose difficulty (on the logit scale) is near the competency cut off score of the scale.

(The critical need is simply to determine, for each student, whether he/she has reading competency above or below a specified point on the logit scale. A test form with only a few items, all with difficulties near the cut off point, may provide as much information concerning this decision need as a longer test form which has item difficulties distributed throughout the logit scale. For this reason, the item pool will contain only items with difficulties quite near the reading competency cut off point. This will allow shorter tests (with correspondingly less reproduction costs) to be used and with no appreciable loss of information).

3. Additional items from other sources may be calibrated and linked to the CAT items. Additional items with difficulties near the competency cut off point will be added to the pool.
4. Each new test form that is to be used is created by drawing items from this pool. This drawing will be done so that the average item difficulty is approximately equal to the cut off point.

Validity

Several different validity issues have arisen over the competency testing, most of which have not yet been adequately resolved. One of these unresolved issues is that of possible test bias. A great difficulty exists in examining this issue: for most models of test fairness, an external criterion must be identified and measured. Such a task would be difficult enough under objective procedures. However, the reality is that such a selection would also be so intertwined in different political and social factions as to be even more complicated. The other great difficulty here is that there are many different models of test fairness and for the most part they are not internally consistent; that is, a measurement that is fair under one model is seldom fair under another model. It is interesting to note that if one particular model of test fairness - the Rasch Model - is arbitrarily accepted as the standard, then the problem of how to identify and measure an external criterion disappears. The question of possible test bias can be answered by use of the Rasch model without the need for such an external criterion. 22

A second validity issue, which has been resolved in an informal manner, is that of curricular and instructional validity. These are defined as the correspondence between test items and (1) curriculum objectives of grades 1-8 and (2) content taught in fact by the 8th grade. All test forms used in the competency program have been revised by the district curriculum staff and generally judged to be satisfactory in these respects. The STEP is perhaps not quite as valid as the CAT in the following way: The subject matter of the STEP includes materials covered only as part of the senior high school curriculum and even some material covered only by courses intended for college-bound students. This is one of the primary reasons why the CAT is offered to high school students as an alternative to the STEP. By this means, the overall assessment program has acceptable curriculum and instructional validity.

A final validity issue involves the degree of correspondence between (1) the operational definition of "8th grade competency" that is currently being used and (2) the intended meaning of this level of competency, as perceived by the board of trustees who formulated the policy. Consider, for example the following experiment that might be performed.

The cutoff score for the 8th grade CAT Reading administration, in terms of raw score units, is 55 raw score (out of a maximum of 85 test items). Suppose that the board members were asked to examine each of these 85 test items and to reflect on the content knowledge that would be involved in correctly answering each of these items. After this task was completed, the board members would then be asked the following question:

"Do you agree that any student who can correctly answer 55 of these items (65%) has an 8th grade competency?"

A conjecture as to how board members might answer the question would be hazardous and will not be offered in this paper. However, considering how educational jargon is bandied about without serious effort at communicating the intent of the jargon, it should not be considered out of the

realm of possibility that this simple experiment might reveal a serious gap between the understanding of one or more of the board members and those who happily created those wonderfully precise and highly measureable operational definitions.

Results and Conclusions

How did the group of students who were tested by the CAT in the spring of 1977 fare? How many students still have not reached the required level of competence? The total enrollment for the 10th grade in 1976-77 was 4833, of which (53%) had not met the competence requirements at the end of the 9th grade. The first special testing session consisted of the CAT math test (Form B, Level 4), administered in the spring of 1977. An additional 13% of 10th grade passed the test on this administration. Thus, at the end of the 76-77 school year, 40% of the 10th graders still had not met the math requirement. Only 4% of the total 11th grade were enrolled in the Fundamentals of Mathematics Tutorial class during the fall quarter (1977-78). It should be noted, however, that 3% of the students were exempt from the requirements because they were classified as special education students. Others, who were not exempt and had not passed the test by this time, were not enrolled in the tutorial math class because they had not yet completed their 6th quarter of required math courses. Still others were not enrolled simply by error.

There have been two additional quarters of testing during 1977-78. The results are included in Table 1.

Table 1: Results of Competency Testing 1977-78

	Number Tested	Number Passing	% Passing
Fall Testing			
1. FOMT Classes	206	105	51.0%
2. Others	628	296	47.1%
Sub Total ₁	834	401	48.1%
Winter Testing			
1. FOMT Classes	178	90	50.6%
2. Others	721	343	47.6%
Sub Total ₂	899	433	48.2%
Total	1,733	834	48.1%

As a result of this testing an additional 17% have now met the competency requirements. At the end of the fall quarter there has been less than 1% (n=4) of the students who have placed on file letters from their parent or guardian (s) acknowledging that the student proposes to graduate without meeting the requirement.

The final results of the program in math cannot be determined until the current 11th grade students have all finished high school. However, at present it appears that approximately $\frac{1}{2}$ of the students who have completed their 6th quarter math and who have not previously met the competency meet it after each quarter of FOMT classes. If this trend continues, most of the students will have met the math requirement by the end of twelfth grade.

Since all students are required to take language arts for three years (as opposed to two years for math), the reading requirement need not be assessed until the end of 11th grade. Initial testing for this requirement has just begun, and no data are yet available concerning number of students who will pass. However, by the end of ninth grade, 63% of the students had met this competency through the regular district testing program; thus the initial problem seems somewhat less severe than for math.

Overall, there are three general conclusions that can be drawn from this experience:

1. Careful consideration to variety of problems and details such as are noted here will be needed to implement a minimum competency testing program.
2. Initial testing should probably begin well before any graduation requirement actually takes effect, and remedial classes carefully planned. This may result in a relatively small number of students who do not have the graduation competencies by the end of twelfth grade.
3. If you need to implement such a program, you are going to lose sleep!

Reference notes

1. Gilman, D. A. Minimum Competency Testing: An insurance policy for survival skills. NASSP Bulletin, 1977, 61, 77-84.
2. Barron, W. E. et al. Adult Functional Competency: A summary. University of Texas at Austin, Division of Extension, 1975. ERIC Accession Number ED 114 609.
3. Report on Education Research, November 30, 1977, page 2.
4. Dixon, N. R. Testing--its impact on expectations, practice, accountability. Educational Leadership, 1978, 35, 294-297.
5. Basic Skills Assessment Around the Nation. Princeton: Educational Testing Service, September, 1977.
6. Walker, D. F. The Hard Lot of the Professional in a Reform Movement. Educational Leadership, 1977, 35, 83-85.
7. Cawelti, G. Requiring Competencies for Graduation--some curricular issues. Educational Leadership, 1977, 35, 86-92.
8. Walker, D. F. op. cit. #6.
9. Clark, J. P. & Thomson, S. D. Competency Tests and Graduation Requirements. National Association of Secondary School Principals, 1976.
10. Gilman, P. A. op. cit. #1.
11. Basic Skills Assessment Around the Nation, op. cit. #5.
12. Pipho, C. Minimal Competency Testing: A look at state standards. Educational Leadership, 1977, 34, 516-520.
13. State Requirements for minimum competency testing. Education Daily special supplement. Washington, DC: December 15, 1977.
14. Excerpted from Board Policy 5127, Austin Independent School District, Board of Trustees. 1975.
15. Holley, F. M. Compensatory Testing Management, Unpublished paper, 1977.
16. Watkins, et. al. Evaluation Design: High School Competency Requirements. Austin Independent School District, September 15, 1977.
17. op. cit., #14, as revised. November 22, 1976.
18. Loret, Peter G., et. al. Anchor Test Study Users Manual. Berkeley: Educational Testing Service, 1973.

19. Wright, B. D. Sample-free Test Calibration and Person Measurement. Paper presented at Invitational Conference on Testing Problems, Educational Testing Service, Princeton, N. J., Oct., 1967.
20. Wright, B. D. Solving Measurement Problems with the Rasch Model Journal of Educational Measurement. 1977, 14.
21. Personal communication between George Ingebo and James Watkins.
22. Wright, B. D. op. cit. #20.
23. McClung, Merle Steven. Are Competency Testing Programs Fair? Legal? Phi Delta Kappan, 1978, 59, 397-400.